P18 Sensitivity of high-resolution regional climate model to urban parameterizations for Chicago metropolitan area

Sharma, Ashish, Harindra J. S. Fernando, Jessica Hellmann, *University of Notre Dame;* and Fei Chen, *National Center for Atmospheric Research*

This study explores the sensitivity of mesoscale urban heat island (UHI) simulations to urban parameterizations, focusing on the Chicago metropolitan area (CMA) and its environs. For this purpose, a series of climate downscaling experiments using the Weather Research and Forecasting (WRF) model at 1-km horizontal resolution. 10-day simulations during a heat wave period in Chicago are considered to test and validate the model sensitivity. This study utilizes National Land Cover Database (NLCD) 2006 classifications and NUDAPT data to test UHI sensitivity for CMA. Among different urban parameterization schemes, BEP+BEM best reproduces the urban surface temperatures in comparison to other urban schemes. Results show that UHI is more pronounced with BEP and BEP+BEM schemes due to explicit accounting of anthropogenic heat (AH). The study also investigates the effects of urbanization on regional climate by replacing Chicago metropolitan area by agricultural landscape, which yielded increased surface wind speeds due to reduced mechanical and thermal resistance.